incorporated. Reconsideration of the pending claims is respectfully requested.

The U.S.C. §102(b) rejections

Claims 1-54 are rejected under 35 U.S.C. §102(b) as being anticipated by **Tanaka** *et al.* (U.S. 6,039,834) and by **Shrotriya** (U.S. 5,843,239). Applicant respectfully traverses these rejections.

Applicant's invention

With regard to Applicant's claims 1-8 the invention is directed to a method of cleaning a process chamber by introducing at least one cleaning gas into the chamber and using a rapid heating module positioned inside the process chamber to rapidly increase and uniformly maintain the temperature of all chamber parts during cleaning (pg. 17, ll. 12-15, Fig. 1). The invention as recited in claims 9-15 recite a cleaning method whereby at least one halogen-containing gas is introduced and the rapid thermal module is located in the process chamber and comprises a high power lamp assembly, a resistive heater assembly, an inductive heater assembly,

or a combination of two or more of the assemblies (pg. 24, ll. 3). Claims 16-18 recite that at least one fluorine-containing gas is introduced and further that the high power lamp assembly is positioned in the bottom of the process chamber and the resistive or inductive heating assembly is placed the between the chamber walls and the chamber liner (pg. 23, ll. 28 to pg. 24, ll. 5).

With regard to claims 19-26, Applicant's invention is directed to a method of cleaning a process chamber by applying an in plasma to at least one precursor gas in the process chamber and employing a rapid heating module located inside the process chamber to rapidly increase and uniformly maintain the temperature of all chamber parts during cleaning (pg. 18, ll. 17-18). In considering claims 27-33 a plasma is applied to a halogen-containing gas and the rapid thermal module is as recited in claim 9 (pg. 24, ll. 3). Claims 34-36 are directed to a method whereby a plasma is applied to a fluorine-containing gas in the process chamber and further that the rapid heating assemblies are placed within the process chamber as recited in claim 16 (pg. 23, ll. 28 to pg. 24, ll. 5).

In considering Applicant's chamber cleaning method as recited in claims 37-54, a plasma is applied to at least one precursor gas (claims 37-44), to at least one halogen-containing gas (claims 45-51) or to at least one fluorine-containing gas (claims 52-54) in a remote chamber and the reactive species is introduced into the process chamber. The rapid heating module (claims 37-44), the types of rapid heating modules (claims 45-51) and their locations inside the process chamber (claims 52-54) are as recited in claims 19-26, claims 27-33 and claims 34-36, respectively.

Tanaka *et al.* reference (U.S. 6,039,834)

The Examiner states that **Tanaka** *et al.* (entire document; esp. col. 25-27) teach the method as claimed. **Tanaka** *et al.* teach an upgraded CVD system that provides a remote microwave-generated plasma source as a retrofit to or removable addition for the CVD system to clean the chamber (col. 3, ll. 28-31). Reactive gases are fed to the remote microwave plasma module whereupon a plasma is formed. Radicals from the plasma are delivered to the processing chamber whereupon cleaning of the chamber occurs (col. 15, ll. 52-67). During cleaning, chamber

temperature is controlled by regulating the temperature of the heated pedestal (col. 25, ll. 12-24).

Tanaka *et al.* as applied to Applicant's claims

In considering claims 1-54 a rapid heating module is located in the process chamber which is employed during cleaning. **Tanaka** *et al.* teach that the temperature is regulated in the chamber only by maintaining the temperature of the heated pedestal. No teaching of using a separate rapid heating module as an adjunct to heat the chamber parts quickly is found.

Additionally, in claims 1-18 a thermal cleaning process is used and in claims 19-33 an *in situ* plasma is used to clean the process the chamber in concert with the rapid heating module. **Tanaka** *et al.* teach that, during a cleaning process, a remote plasma is applied to a gas.

Applicant's claims 34-52 may recite a remote plasma, as taught in **Tanaka** *et al.*, however, to reiterate, **Tanaka** *et al.* does not teach a rapid heating module in the process chamber. Absent these teachings **Tanaka** *et al.* do not anticipate Applicant's claimed invention.

Shrotriya reference (U.S. 5,843,239)

The Examiner states that **Shrotriya** (entire document; esp. col. 10-13) teaches the method as claimed. **Shrotriya** teaches a two-step method for removing a deposition residue from the interior of a processing chamber by forming a plasma of a first cleaning gas *in situ* to clean residues from the interior of the chamber and then forming a plasma of a second cleaning gas *in situ* to remove any by-products from the first cleaning step (Abstract; claim 1, 15). Heat is distributed in the CVD system by an **external** lamp module which provides an annular collimated pattern of light through a quartz window **into** the chamber (Applicant's emphasis) or by a resistively heated support platen to rapidly and uniformly heat the susceptor and substrate during deposition (col. 5, ll. 52-61; Fig. 1A).

Shrotriya as applied to Applicant's claims

Again, in each of claims 1-54, it is recited that a rapid heating module located in the process chamber is employed. **Shrotriya** is silent about how specifically the temperature is

maintained at 300-500 °C during a cleaning process. Assuming, *arguendo*, that controlling the temperature of the lamp module controllably heats the susceptor (col. 10, ll. 1-21), as similarly done in **Tanaka** *et al.*, by maintaining the temperature of the heated pedestal, this is not Applicant's invention. The lamp module used in **Shrotriya** is disclosed to be specifically external to the chamber and only heats the susceptor/substrate, no additional rapid thermal module is taught to effect rapid and uniform heating during a cleaning process.

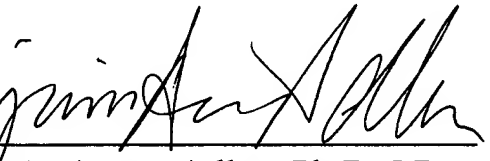
Also, in considering claims 1-18 and 37-54, Applicant's cleaning methods utilize thermal cleaning or a remote plasma, respectively. **Shrotriya** teaches only an *in situ* plasma activation of gases to clean a process chamber. Absent these teachings, **Shrotriya** does not anticipate Applicant's claimed invention.

Therefore, as these reference are not valid prior art against the instant application under 35 U.S.C. §102(b) and in view of the preceding remarks, Applicants respectfully submit that neither **Tanaka** *et al.* nor **Shrotriya** anticipate claims 1-54 under 35 U.S.C. §102(b). Accordingly, Applicants request that the rejection of claims 1-54 under 35 U.S.C. §102(b) be withdrawn.

This is intended to be a complete response to the Office Action mailed March 19, 2003. If any issues remain outstanding, the Examiner is respectfully requested to telephone the undersigned attorney of record for immediate resolution. Applicants believe that no fees are due, however, should this be in error, please debit Deposit Account No. 07-1185 on which the undersigned is allowed to draw.

Respectfully submitted,

Date: June 20, 2003



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